Mission Report ESAPP Q804

Forest Regeneration Capacity and its Enhancement by Forest Management and Silviculture in Cabo Delgado

November 2008

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Cover photo: Daily difficulties in remote areas of Northern Mozambique remain, in spite of potential advantages that a forest concession should provide to the people living within its limits. (photographs by the authors)

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SDC has been involved in rural development in Cabo Delgado for more than 30 years. Shortly after the independence of Mozambique, projects in water supply and integrated rural development were initiated. The silvoagropastoral project FO9 based in Mueda was a very early experience in forestry in Cabo Delgado. Andreas Kläy was responsible for the forestry sector in FO9 for 3 years in the early 1980s and had an opportunity to initiate an exchange of ideas and experience in rural development theory and approaches with Yussuf Adam, who was doing research in human anthropology and history in the province.

25 years later, the current situation of forest management in Cabo Delgado was reassessed, with a specific focus on concessions in the North. The opportunity for a partnership between the MITI SA, the University of Eduardo Mondlane, and CDE was created on the basis of this preliminary study1. The aim of this partnership is to generate knowledge and develop capacity for sustainable forest management.

The preliminary study showed that "…we have to face weaknesses and would like to start a learning process with the main institutions, organisations, and stakeholder groups active in forest management and research in the North of Cabo Delgado. This learning process will involve studies supported by competent research institutions and workshops …" The specific objectives of ESAPP project Q804 are the following: 1. Contribute to understanding of the forestry sector; 2. Capacity development for professionals and academics; 3. Support for the private sector and the local forest service; 4. Support data generation at Cabo Delgado's Provincial Service; 5. Capacity development for Swiss academic institutions (CDE and ETHZ).

A conceptual planning platform was elaborated as a basis for cooperation and research in the partnership (cf. Annex 1). The partners agreed to work on two lines of research: biophysical and socio-economic. In order to ensure a transdisciplinary approach, disciplinary research is anchored in common understanding in workshops based on the LforS methods. These workshops integrate the main stakeholders in the local context of the COMADEL concession in Nangade District managed by MITI SA, and take place in the village of Namiune.

The research team observed that current management schemes consist mainly of strategies of nature mining by most stakeholders involved. Institutional settings - formal and informal - have little impact due to weak capacity at the local level and corruption. Local difficulties in a remote rural area facilitate external access to resources and are perpetuated by the loss of benefits. The benefits of logging remain at the top level (economic and political elites). The interests of the owners of the concession in stopping the loss of resources caused by this regime offers a unique opportunity to intervene in the logic of resource degradation and agony in rural development and forest management.

1 Regeneração Florestal em Cabo Delgado. Relatório do estudo inicial Novembro / Dezembro 2007, Andreas Klaey e Yussuf Adam 2008

1 Introduction

1.1 Preliminaries

The Q 804 ESAPP project "Forest Regeneration Capacity and its Enhancement by Forest Management and Silviculture in Cabo Delgado" (Q804) aims to identify and explore some key linkages between sustainable management of natural resources and poverty reduction at the decentralised level.

"Sustainable use of natural resources" is understood as "maintaining the regeneration rate (supporting functions/services) to maintain services for users in a sustainable way". This definition is based on the UN Millennium Ecosystem Assessment of sustainable development and ecosystem services. The CDE concept of "sustainable resource management", as documented in the CDE basic module of Learning for Sustainability (LforS), is used in this project to support the process of action research.

This report is based on preliminary field research conducted by Andreas Klaey (CDE, University of Bern) and Prof. Yussuf Adam (UEM, Universidade Eduardo Mondlane) in November 2007 in collaboration with the Department for Forests and Wildlife in Cabo Delgado Province and Miti Ltd. (commercial timber industry with four concessions in Cabo Delgado).

In order to support the coordination and orientation of the ongoing learning and research process, key elements of the preliminary field research were compiled in a document referred to as the "interactive platform". The first version (in English) was created during the preparation of the mission in November 2008 at the CDE by Andreas Klaey and Dimka Stantchev (see annex). The platform was further discussed and adjusted by Yussuf Adam and Andreas Klaey during the first phase of the November 2008 mission and a Portuguese version was also created (see annex).

1.2 The main results of the November 2007 field research

All roughly observed indicators of the ongoing dynamics in the forest resources of Cabo Delgado confirm the presence of rapid degradation and deforestation processes. The traditional agricultural and collecting activities of the rural population, which have long been increasing irregularly –including uncontrolled bushfire – have always put pressure on ecosystems. They have been causing local degradation for a long time, but so far have not impacted the regeneration processes to an overly great extent.

Forest exploitation during colonisation led to an initial heavy decline in the high value of the forests. Over the last two decades forest use has taken on very intensive and, at the same time, fuzzy forms. There is no effective control, and the negative impacts on the remaining forest capital are certainly extremely severe. Consultation of readily available information is not a sufficient basis for in-depth quantitative analyses, but nevertheless made it possible to distinguish two **types of dynamics**.

First, legal and illegal logging is rapidly diminishing the potential for future forestry in all forests of Cabo Delgado. The significance of this degradation with respect to regeneration and ecological ecosystem services cannot be assessed on the basis of available data and observations. This dynamic has been retarded slightly by the establishment and management of the Quirimbas National Park, and, little by little, by better management of the established forest concessions.

Second, in the vicinity of important urban centres – mainly Pemba – overexploitation for informal charcoal production has caused rapidly degrading stretches of forest along the roads (up to distances of 100 km).

The sparse activities of rural development projects that aim to foster and enhance forest resources have so far had a very limited effect and have been of little relevance to the status of ecosystems. Important experience has been gained, contributing to currently available knowledge about forest management. However, the complete absence of any follow-up, systematic monitoring, and protection of installed trials dramatically reduces the potential for gaining experience and for capacity building. Specific experience with the FO-9 project, which first began in 1982, in implementing afforestation, reforestation, and agroforestry plantations with exotic species such as Eucalyptus camadulensis and E. citriodora, Gemelina arborea, Aziderachta indica, Cassia siamea, Leucaena leucacephola, Sesbania, and Delonix regia, could provide a basis for assessing the potential of these species. However, the value of this experience has been undermined by the ongoing destruction of the plantation plots through cultivation. As there was no follow-up regarding the established plantations, they have been considered abandoned and converted to cropland – greatly appreciated for its good soil quality. Small trial plantations with native species have been completely destroyed. Thus, the main lessons learnt are the following:

- Reforestation measures present a high risk of failure and have been of little value in responding to socioeconomic needs and fulfilling ecological functions;
- The lack of institutional capacity to capitalise on forestry experiences and develop knowledge prevents any systematic improvement in forest management in Cabo Delgado.

Sustainable use of renewable resources can only be achieved on the basis of a system in which multiple users and stakeholders are aware of the objective of sustainability and regulate their (extractive) activities accordingly. Sustainable or unsustainable use of resources is shaped by a combination of bio-physical and socio-economic factors on a multi-level basis. Therefore, a key component in developing knowledge and capacity for sustainable management of forest ecosystems consists of identifying the social and economic dynamics underlying resource use. In this vein, preliminary research on forest use in Cabo Delgado indicates that further investigation should examine:

- The services that the ecosystem provides to sustain people's livelihoods (ecosystem services as used by the Millennium Ecosystem Assessment, MEA)
- The economic and social effects of concessionary-based resource exploitation at the community (employment, health, education) and regional (investment, technological transfer, market access) levels
- The forest product value chain

1.3 Objectives of the project

Based on these preliminary findings, the overall objective of ESAPP Q804 is to conduct an interdisciplinary learning process to build capacity in forest management and research. The learning process will include two lines of research:

A. Bio-physical: Regeneration capacity and its enhancement through management and silviculture.
This line of research should help to generate improved data on exploitation, regeneration and reforestation of 4 species of first-class trees (i) *Chanfuta - Afzelia quanzensis*; (ii) Jambirre/Panga-panga - *Millettia stuhlmannii*; (iii) Pao Ferro - *Swartzia madagascariensis* and (iv) Umbila - *Pterocarpus angolensis* (if available).

B. Socio-economic: Impacts of forest management and logging on livelihoods (local services and income, value chain, implementation of Wildlife and Forest Law "20%") and ecosystems.

The expected outcomes of the learning process are as follows:

- ✓ Increased knowledge and awareness of the sustainable use of forest products and services by communities and community representatives.
- ✓ Capacity development for Mozambican professionals, academics and students in forest exploitation, research, intercultural experience and knowledge generation.
- ✓ Increased knowledge and awareness of the effects of management techniques carried out by a private sector actor (Miti.Ltd.) on reforestation in Northern Mozambique, built and shared with the Cabo Delgado' s Provincial Service of Wildlife and Forestry, to support implementation of improved regulations and management plans.
- ✓ Support for the private sector and the forest service for management and conservation of forest resources in the Province of Cabo Delgado, acknowledging and respecting the needs and rights of communities.

1.4 Structure of the report

The presentation of this report is organised as follows:

The next section sets the stage of the LforS workshop, with a brief description of Namiune village, the Miti Ltd logging company, and the workshop participants. We go on to provide an overview of the main findings of LforS, and conclude by suggesting some lines of research to be investigated by the multidisciplinary research team in the course of 2009. It must be noted that this report summarises observations, findings, and preliminary interpretations from the authors' perspectives. It is not intended as a scientific article; it has rather the objective of facilitating information flow and co-ordination between the main actors in this ESAPP project.

2 Learning for Sustainability (LforS) workshop

The LforS workshop is a very important step in the action research process because it constitutes a framework in which all users of natural resources interact and exchange views over a number of days (which is rarely the case in reality) and provides information on i) how natural resources are managed in the local context, and ii) the social relations underpinning the harmonious or conflictual use of these resources. Therefore, the findings of LforS should provide a relevant basis of information for the formulation of research hypotheses for transdisciplinary research carried out by ESAPP.

2.1 LforS venue: the village of Namiune (District of Nangade, Province of Cabo Delgado)

The venue of LforS – where stakeholders' interactions take place – will largely determine the successful establishment of "open communication" among natural resource users (as opposed to more "strategic communication", where individual or collective motives are not revealed to the same extent). For this project, a key criterion for selecting the village of Namiune (one of 28 villages registered in the District of Nangade; see map below) as the venue of the workshop was the possibility to conduct the work directly in the context of local forest users. Additionally, the whole village lies within the borders of the COMADEL concession exploited by Miti Ltd. (which covers a total area of more than 50,000 hectares, equal to 1/6 of the district of Nangade). Therefore, according to the Mozambican Forest and Wildlife Law, the communities registered in the village of Namiune should be the recipients of 20% of the tax revenues collected by the Provincial authorities from the logging company, Miti Ltd. A final criterion in favour of organising the workshop in Namiune was that of accessibility, given that the village is a 2-hour drive away from Mocimboa da Praia (during the dry season) on the road that was constructed by Miti Ltd. to exploit the concession, and only about a 30-minute drive from the capital of the district, Nangade Sede.

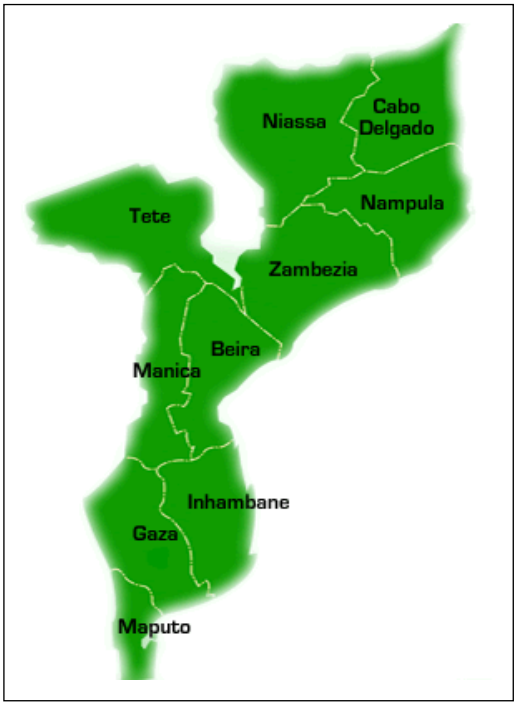

Figure 1 Map of Mozambique (source: World Bank)

Figure 2 Map of Cabo Delgado (source: World Bank)

The District of Nangade borders Tanzania and covers 3,031 km² with 63,739 inhabitants. The population of Namiune is 1,085 (information from the village Secretary), which represents a rather small portion of the total population of the District. Nevertheless, it is rather surprising to find such a significant number of people living, farming and gathering inside the concession, given that the process of delimitation usually keeps villages out of forest concessions to reduce potential sources of conflict. The situation seems to be attractive enough to support people's livelihoods, despite numerous complaints about wildlife disturbing agricultural production. In fact, it seems that the tendency is for people from other villages to establish villages within the borders of the concession in order to benefit from the 20% of forest tax revenues. Yet data on population growth within the limits of the concession are not provided on a regular basis by the local authorities. The population in the village of Namiune is quite diverse in terms of places of origin, but two major ethnic groups dominate the village and live in distinct quarters (see report by Prof. Adam et al. for more information).

2.2 The Miti Ltd. logging company:

Miti Ltd. is one of the most important logging companies in Cabo Delgado, currently exploiting four concessions of 50-year duration, in addition to a number of simple licences (one-year duration). The concessions are all located north of Cabo Delgado Province, in the districts of Moçimboa da Praia, Nangade, Muidumbe, and Mueda. Villages rarely lie within the limits of these concessions. As mentioned above, Namiune is one of the few villages that lies completely inside a concession.

Figure 3 These pictures were taken in mid November 2009 in the COMADEL forest concession exploited by Miti Ltd. They show commercial exploitation by informal operators (not known to Miti Ltd.), who nevertheless cut, transport (on the road constructed by Miti Ltd.) and trade construction material, most likely for customers in Mocimboa da Praia.

The owner of Miti Ltd. is well aware that successful exploitation of the COMADEL concession relies heavily on cooperation with the communities living in its territory. Moreover, this ESAPP project is motivated by the request of the owner of Miti Ltd. himself to have access to more information on natural resource users and usages, with the aim of having more harmonious relations with the communities. This constitutes a very important entry point for action research, as one of the key elements for achieving sustainable use of resources is for all actors to be aware of the social, ecological, economic, cultural and political factors underlying access to and use of these resources. It is usually argued that logging companies only extract resources with little regard for regeneration potential, including the social conditions underlying this potential. In this case, the fact that the owner of the logging company himself strongly expresses how aware he is that any enhancement of forest management is highly dependent on cooperation between the population living in the concessions, the local authorities and the logging company, is a very valuable factor that must be further explored. This represents a very important venue for transforming potential conflicts over resource use into mutually beneficial situations.

2.3 Workshop participants

The LforS methodology states that workshop participants should include stakeholders from civil society and the private sector, as well as public authorities, in order to represent as many interests and as wide a range of perspectives on the use of natural resources as possible.

Community: as can be seen from the list of participants in the annex, there was a good representation of village dwellers, whose livelihood strategies are based on diversification of activities and income sources. The majority of dwellers practiced agricultural production – mostly for household subsistence – combined with other activities that rely on the forest, such as exploitation of non-timber forest products (plants collected for food, medicinal use or construction material) and exploitation of timber on the basis of simple licences (only for local transformation and use within the concession). Many dwellers also hunt wildlife, declaring that they use the meat for their own consumption rather than for commercial purposes, which requires a hunting licence).

Figure 4 During the workshop, the research team was exposed to the LforS participants' daily activities, such as making use of wildlife, as a way to establish a common understanding of the situation and preferences in terms of coping strategies.

Private sector: representing the private sector, the recently hired forest engineer of Miti Ltd. attended and co-moderated the entire workshop. The owner and manager of Miti Ltd. were also present for occasional discussions and attended the closing of the workshop. The fact that the owner of the company did not attend the entire workshop went against one of the key methodological objectives of LforS – that of having resource users at all levels share their views and discuss common issues. Hence the quality of the findings of this LforS cannot be regarded as optimal, given that this process was not accompanied by all key stakeholders. In addition, this was a missed opportunity for "direct" learning for the logging company itself, as the workshop venue was intended to provide a framework for exchange on conflictual resource use, as well as other social or power conflicts that could undermine the "social harmony" towards which Miti Ltd. is striving. Having expressed these methodological concerns, we also acknowledge the time constraints that the owner of the logging company must face in attending a week-long workshop.

Authorities: as far as official authorities were concerned, the provincial level was clearly under-represented, with only two controllers of the provincial Department of Forest and Wildlife partially attending the workshop. At the district level, only one representative of the department of Agriculture and Economic Development was present.

Figure 5 Intensive discussion among local participants under observation of national researchers

This weak representation on the part of provincial authorities occurred despite pro-active visits by LforS actors Andreas Klaey and Yussuf Adam to officials of the Forest and Wildlife Department in the provincial government of Pemba ten days before the start of the workshop (see list in annex). The reasons for this low attendance rate could be linked to the location of the workshop: the 4-hour journey from Pemba to Mocimboa and another two hours on a tertiary road, coupled with accommodation in tents with no electricity in the village and no running water, acted as a deterrent for participants from the provincial capital. Other explanations can also be found in conflicting interests regarding the use and management of the concession, or the lack of willingness of the parties to expose themselves in a setting devoted precisely to confronting different views and conflicting interests, as well as identification of ways to come to terms with practices that lead to unsustainable use of resources, with all stakeholders taking part in the discussion. Finally, from the perspective of governance, the lack of participation by state authorities in events involving civil society representatives at the local level tends to reflect a pervasive weakness of the decentralisation process.

It should be noted that the leader of an auditing group from the national level, in a mission to control the timber park of Miti Ltd. (namely the former Director of Agriculture in Cabo Delgado), expressed his interest in participating in future LforS workshops.

Figure 6 Participants at the workshop in Namiune

3 Findings of the workshop

The issues presented below are only indicative of some aspects of research to be addressed and/or further investigated by the research team in the course of 2009. These findings complement the report produced by the UEM team (Prof. Yussuf Adam, Julio Machele, Virgilio Manjate) in Portuguese.

A key finding is that **the regeneration potential is quite high (because many exploited species are abundant in secondary forest formations), but the regeneration rate of the concession is sub-optimal. This seems to be mainly due to frequent uncontrolled fires resulting from illegal hunting, as well as inappropriate burning techniques for agriculture and other unknown reasons.**

In addition to undermining the regeneration potential, deforestation at an uncontrolled rate in the communities reduces biodiversity and the presence of wildlife, decreases forest ecosystem services for the local population, and erodes livelihoods and food security (diminishing the productivity of agriculture and income sources owing to exploitation of timber and non-timber forest products).

The section below looks at the manifold factors that account for this situation in three categories: agriculture and ecosystem use; exploitation of the concession; governance and management.

3.1 Agriculture and ecosystem use

Overall, the exploited concessions visited (family size) suffer from low agricultural productivity which, in the view of workshop participants, is due to lack of means and techniques such as fertiliser and plant protection, as well as heavy damage caused by wildlife. The team also observed that another factor accounting for this low productivity is the poor use of ecosystems, particularly water resources: the geographic location of several cultivated areas leads to sub-optimal use of the available ponds and rivers. The population's resistance to practicing agriculture "in blocks" is another factor that must be taken into account when analysing low agricultural productivity, as well as a number of social and cultural factors that influence the choice of location of cultivated areas. There seems to be an important relation between traditional access to land and difficulties in organising agriculture "in blocks" that would support effective defence against damage caused by wildlife.

Figure 7 Resource management in all sectors is far from sustainable. Sustainability must respond to basic needs, be based on local knowledge, and relate to the activities of the local population.

A corollary of this low productivity is the **expansion of cultivated areas**, as indicated by the extensive use of slash-and-burn practices to establish agricultural plots. Interestingly, it seems that land availability is not a constraint within the territory of the concession, which makes the issue of land use change by way of extensification an even more pressing concern in terms of sustainable use of resources.

An indicator of land use change can be found on the **numerous deforested plots where cashew nut trees have been planted** in recent years. Two reasons account for the widespread production of cashew nuts: firstly, in the face of the very limited existence of income-generating activities in the village, production of cashew nuts represents a source of income diversification – a low-cost opportunity given the widespread perception of unlimited access to land. Second, planting cashew nut trees is also a way of establishing new villages and new "land rights" in a given area, which gives the right to benefit from the 20% of the forest tax revenues (500 people are enough to be legally considered a village).

Regardless of the reason(s) that drive the expansion of areas for cashew tree plantations, these practices have serious consequences for i) regeneration potential, by putting unprecedented pressure on the deforestation rate, and ii) for the economic sustainability of this activity; farmers lack access to know-how and inputs to protect their trees against pervasive diseases.

Conflicts with wildlife is another pressing issue in terms of land use, illustrated by the fact that the majority of the LforS participants cited conflicts with elephants as a major obstacle to

agricultural productivity and sustainable management of resources. Villagers are clearly confused about the role and responsibility of the district authorities in terms of managing these conflicts. In the absence of any measures taken by district authorities to protect their plots, farmers build traps – an illegal practice – in which captured elephants are slaughtered with traditional weapons (a process that can result in up to two days of agony for the animal). In the course of 2008, two elephants were slaughtered (based on the information provided by the workshop's participants). Interestingly, the time of the year when these elephants were trapped corresponds to the "season of hunger". This could indicate that the animals were killed to provide a source of protein at a time of limited food consumption. This assumption needs to be investigated further.

These conflicts with wildlife cannot be solved in the absence of a clear understanding by the population of the role and competence of District authorities in managing and applying hunting quotas through operators (in this case Antamozambique). Information regarding the right of the community to benefit from each animal that has been hunted on its territory is not clear to the community and should be clearly spelt out by the relevant level of authority. In other words, the community and other relevant actors at the village level (such as the Natural resources management committee) need to have the law and its implications explained, particularly with respect to the proceeds from the " 20% of the hunting licence fee" to the communities.

Figure 8 Livelihoods are directly threatened by unresolved conflicts between men and animals that result in food insecurity and violation of the Wildlife Law (as these traps are illegal) and missed opportunities for legal revenues at the community level (proceeds from the hunting licence fees).

3.2 Exploitation of the concession

The concession is exploited on the basis of management plans, drawing on the rough assessment of timber potential made by the concessionary. These estimates are characterised by a very high level of uncertainty, due to the fact that very little is known about the history of degradation/ deforestation (i.e. prior to the establishment of the concession). This is combined with the fact that the current data basis for the management plan and the underlying statistical extrapolation are weak, all of which contributes to the increased uncertainty of the potential estimates.

Figure 9 2008 Two elephants have already been caught in this pit-fall and slaughtered

Overall, preliminary assessment of the concession's exploitation indicates a tendency towards overexploitation, particularly for some blocks that are easy to access and highly exploited. It must be noted that the logging company itself has made some attempts to reforest, although these attempts are not made or reported systematically. In addition to reorganizing the reforestation process on a more systematic basis, this process could also benefit from additional resources coming from the 15% of the licence fee revenues (as stated by the law). Additionally, this process could be further supported by the community services themselves, notably in the form of established nurseries that would increase income for the community and decrease the cost of transport for the company.

Pervasive exploitation for commercial use with no licence is a source of growing concern for sustainable exploitation of the concession. This phenomenon is closely linked with potential revenue for the population from exploitation of wood, based on the use of a simple licence

(for transformation and commercialization at the village level only). During the LforS, a number of allegations were made that many trees are being cut without licences for commercial purposes in other villages or even abroad (Tanzania). These allegations need to be confirmed by concrete evidence. The fact that no such evidence exists is an indication of weak control over resources at all levels, namely the provincial controllers (fiscais), the natural resources management committee, and the logging company. This also indicates a lack of cooperation among all these levels, resulting from pervasive distrust among all actors and a lack of consideration and recognition of their respective rights and duties.

The training of official community inspectors to fill the gap left by official inspectors (as defined in the Law, but not functioning in reality) would be a simple step towards improving control. In this sense, the concessionary could benefit from the skills of the "olheiros" (traditionally paid to identify mother plants, but unemployed during the resting period) to substitute for the official inspector.

Figure 10 Often it is impossible to know who is exploiting the forest; every stakeholder group blames the others

Figure 11 Elephants often destroy crops before the yield. The footprints here indicate that this was the case in this paddy field at the end of the last rainy season.

3.3 Governance and management

The National legal framework offers a good basis for sustainable forest management, but the institutional and socioeconomic context has so far allowed neither adequate enforcement of this law nor development of the requested capacity for enforcement. At the decentralized levels, the establishment of concessions (as foreseen in the law) could for the first time allow for the establishment of enterprises for pursuing the goal of sustainable forest management. Yet inadequate enforcement and application of the law are undermining the process of better control to promote sustainable resource use while also perpetuating a pervasive lack of transparency that facilitates misuse of power to serve particular interests. This phenomenon is well illustrated by the uncontrolled granting of further licenses, lack of any continuous and systematic control, weak commitment to transparent data management and capacity development, and a lack of pilot projects for sustainable management (the extremely weak participation of the district and provincial authorities in the LforS workshop is a very good indicator of this tendency).

Natural resource management committee

According to the Forest and Wildlife law, the duties of the natural resource management committee are numerous and include: participation in the requesting procedures for natural resource use; conducting activities that contribute to sustainable use of natural resources and improvement of the livelihoods of local communities; solving conflicts between the parties using and exploiting natural resources; and participating in taxability, together with the State.

Yet in reality these committees often fall far short of playing their roles due to limited resources and capacities. It the case of this particular LforS, a clear illustration of this weakness is the lack of control the management committee has over slash-and-burn practices (as described above in 3.1). Furthermore, the natural resource management committee of the village is clearly not organized in a transparent manner (the village secretary is also the President of the resource management committee). Procedures about receiving 20% of the proceeds are not communicated systematically to the communities, and villages do not have bank accounts to receive the money. Another issue of concern is lack of transparency regarding the amount received. In the course of the LforS, it was revealed that the amount received in 2006 for the COMADEL concession (covering 7 villages) was US$ 13,000. Yet there was no registry or accounting book available to confirm this piece of information.

Hence, given the importance of the management committee in terms of striving for sustainable use of resources, as well as social equity and enforcement of the law, its capacities should be greatly reinforced.

Territorial management

The fact that the territorial limits of the concession are not well established **by the logging company** is a potential source of social conflict because communities could claim to have the right to 20% of the proceeds to which they are entitled by law. In addition to poor territorial limitation of the concession, there is widespread establishment of new villages to benefit from the 20% tax revenue (applicable to a community with a minimum of 500 persons). This indicates a need to update the population registry.

Figure 12 Settlements in the concession show the will of the population to gain access to resources despite the difficulties of settlement in the forests.

3.4 Conclusions about the Current State of Forest Management in the Concession and in Cabo Delgado

The forest in the area of the COMADEL concession has been over-exploited for at least 30 years. The government needed cash and was able to generate some income for the population. One rapid way of making money was to cut and sell the valuable species existing in the area. In the COMADEL concession different species were cut in earlier periods e.g. Umbila (*Pterocarpus angolensis*) has been exploited since the very beginning of external exploitation during the colonial era. But one of the rarest timber species in CD, Pau rosa (*Berchemia zeyheri*), was devastated by a Mozambican-Argelian enterprise. Other enterprises also worked in the area.

According to peasants the volume of wood cut during the colonial period and the enterprises existing at that time was child's play compared to today.

What we have in place still today is a paradigm of exploitation that can be characterized as "nature mining." Some timber for logging still exists, as approved by the management plan of the concession; nevertheless, long-term regeneration of the forest is very uncertain – an unknown factor not integrated in management. Despite preoccupation with maintenance of the production potential of the forest in Cabo Delgado, there is open conflict between different countries – Portugal and China – with regard to nature mining.

The Mozambican state tries, through the state apparatus and through Mozambican enterprises such as MITI, to control the situation, especially making sure that only trees with the right measurements are cut.

The peasants see the wood cutting industry as a means of getting earning wages and obtaining funds from the government or from donors.

The coping strategies of the different stakeholders are similar. Everyone wants to earn quick income without considering the sustainability of the operations and long-term livelihood. Operators with the aid of peasants cut everything that can been sold – often timber that in ten years would be much more valuable. The Chinese, who are frequently blamed for this disaster, actually help to salvage the local economy because they are the most important buyers today.

The peasants living in these areas are very preoccupied with the invasion of their land by people from different ethnic groups who occupy their land, cut their wood, and even plant cashew trees –with the help of government and NGO projects – which guarantees the newcomers ownership of land. The local indigenous population is being subordinated to the newcomers. In the village where we worked there were four ethnic groups with conflicting interests.

The land law and the forest law have the purpose of guarantying some kind of sustainable development and equal distribution of revenues. But this is not working. The 20% of the fees collected by the state is being distributed in an unclear context, favouring certain groups over others. The indigenous local population – Macuas and Ajauas – are being relegated to a secondary position.

The coping strategy of the concessionaire has so far been to take maximum profits from the forest. There is a clear need and effort to be profitable and export as much as possible. Government laws are respected but there is no way that even the local authorities can manage to control the situation in the forests and concessions. The company that has the concession pays only the taxes and license fees to the state for its yearly activities (annual licenses) but does not pay taxes as the owner of the concession.

The social part of the concession – job creation, creation of other activities, support to health and social services – is not obvious in a significant way.

One of the ideas of the forest law and forest concessions is that they should be run in such a way that they create permanent jobs for the population, maintain the forests, help the administration and the people to register land, births, etc. These aspects are not present at all.

The solution to such nature mining and non-sustainable coping strategies among the various stakeholders is to manage the concession in ways that go beyond the inventories of the timber volumes that can be cut. Management must create a partnership between the concession holder, the state and the residents in such a way that the economic results of the logging are distributed and support all the residents and their families. The major share of the economic benefits – the profits – goes to the concession holder, who has to pay many formal and informal taxes to the illegal operators and to corrupt officials. Local corruption among government functionaries is visible but most of the benefits go to district and provincial government top brass, especially in the department of forest and agriculture.

The methodology used for this research should also be used to create a true partnership and a management board that will distribute to each stakeholder its own benefits in a transparent way. The concession is given to the concessionaire, but he will not be able to exploit it in a sustainable way if there are no health, education, fire and hunting controls – sustainable forest management linked to rural development. The trees in the end are a free good for the residents. But logging and hunting transforms the trees and fauna into a private good for the concessionaires.

The concession is not run according to the norms and recommendations of the industry and science. What we saw was the practice of nature mining, geared to produce rapid economic results regardless of the sustainability of forest services. Everyone wants money – and lots of it – as rapidly as possible. The concession can be transformed into an operation that creates a win-win situation for the concession owner, the residents, and the state. What is lacking is organization and institutionalization of the different groups, villages, camps to build structures for the local management, and local government of the resources.

There is a social crisis that is quite visible in the lack of services (education, health, communication, water etc.) and control by the institutions and lack of enforcement of the law.

Many cases of sorcery are reported, especially one which is known as lions fabricated by men. In the end the man-made lion, who is always a human, and the one accused of having fabricated it are killed. Everyone knows who killed the lion man or the lion maker, normally a rich

peasant or someone with whom certain individuals in the community had grievances – just or unjust. The killings or homicides are not prosecuted because it is a cultural phenomenon, an act of the traditional gods. The killers go free and the killing is justified as a case of sorcery. In the end this is homicide – extra-judicial homicide – and the executers are local well-to-do people who constitute death squads to eliminate an adversary. Normally the victim is the owner of land or resources that the killers want.

A system that administers the concession socially, ecologically, and economically and guarantees the rights of the citizens – including private property – will guarantee the reproduction of natural resources and of the society. The way the concessions are run and managed – and the state role in the area – constitutes a very volatile and explosive situation which is war-like: a war of humans against the humans and of humans against nature.

4 Suggested lines of investigation

- **Land use change:** deepening understanding of the social, cultural, economic, and ecological dynamics leading to forest degradation and secondary vegetation by communities and identifying relevant methods for measuring the degree of forest degradation and stimulating valuable secondary forests on the territory of the concession.
- **Enhancement of agricultural productivity by means of silvo-agriculture:** what are the best practices (international and Mozambican) that could be applied in the local zones of agricultural production (taking into account social practices and bio-physical conditions)?
- **Improving the economic value of the forest and wildlife use for the population:** adding value to products in the villages, creating awareness of the value of complying with the Forest and Wildlife Law.
- **Enhancement of territorial management and information** on migration of humans and animals living on the territory of the concession
- **Improving implementation of the Forest and Wildlife Law:** information, organisation and capacity building by the natural resource management committee.
- **Improving approaches to integrate existing explicit and implicit knowledge for innovation and sustainable development.**

Figure 13 Bushfire is obviously a limiting factor for the forest regeneration; trees need a period of about 3 to 5 years with little disturbances to grow big enough to survive a bushfire.

5 Annex

“Capacidade de regeneração florestal e seu melhoramento pela gestão florestal e silvicultura em Cabo Delgado” (Q 804)

Plataforma interactiva

06.11.08

O objectivo deste documento é constituir uma plataforma para que os membros da equipa de pesquisa interdisciplinar constituída por investigadores da Universidade de Bern e da Universidade Eduardo Mondlane (UEM) possam trocar ideias e formular perguntas de pesquisa para compreender a “capacidade de regeneração da floresta e seu melhoramento pela gestão e silvicultura em Cabo Delgado”.

O projecto (Q 804) faz parte do programa contínuo ESAPP com vista a desenvolver uma interacção entre o CDE (Centre for Development and Environment) e as Faculdades de Historia e Agronomia da UEM.

Este documento também e um instrumento para preparar o trabalho de campo em Cabo Delgado da equipe transdisciplinar composta por pesquisadores de Moçambicanos (UEM) e Suíços (CDE) e as partes interessadas locais (*stakeholders)*.

Perguntas específicas de pesquisa serão formuladas pela equipa de pesquisa com base nesta plataforma e das discussoes a realizar no seminário planificado para Novembro de 2008 em Cabo Delgado.

1. Contexto

A informação disponível sobre florestas em Cabo Delgado faz suspeitar a existência de dinâmicas altamente insustentáveis. Os dados actualmente existentes sobre a situação da floresta não são suficientemente consistentes para implementar acções coerentes contra a degradação da floresta e desflorestamento com vista a um desenvolvimento sustentável.

Vários actores principais envolvidos no sector florestal em Cabo Delgado contactaram o ESAPP para manifestar as suas preocupações e o seu interesse em obter conhecimentos, competências e capacidades para intervir no processo de regeneração natural das florestas no norte de Cabo Delgado. Uma parceria com o MITI SÁ, sediada em Pemba e Mocimboa da Praia e o Departamento de Florestas e Fauna

Bravia da Direcção Provincial de Agricultura de Cabo Delgado possibilitou a realização de um estudo preliminar (em Novembro de 2007).

Há outras instituições com responsabilidades na utilização racional de recursos naturais renováveis, i.e., Direcção Provincial de Turismo do Ministério de Turismo e Direcção Provincial de Coordenação da Acção Ambiental do Ministério de Coordenação da Acção Ambiental que serão convidadas a participar nas nossas actividades de investigação.

O estudo inicial realizado em Novembro e 2007 permitiu nos tirar três resultados preliminares. Estes conhecimentos iniciais deverão ser testados e mais informação devera ser recolhida para aprofundar o assunto em pesquisa.

1.1 Todos os indicadores, mesmo que grosseiros, imperfeitos ou aproximados, sobre as dinâmicas internas e continuadas do desenvolvimento dos recursos florestais em Cabo Delgado, confirmam a presença dos processos de desflorestamento e de degradação acelerada.

As actividades de caça, recolecção e agricultura tradicionais da população rural que vem crescendo irregularmente há muito tempo – incluindo as queimadas descontroladas – sempre representaram uma pressão sobre os ecossistemas. Estas actividades têm vindo a causar degradação localizada há muito tempo. Mas, até agora, não provocaram nenhum impacto a um ponto que podemos considerar grave ou de não retorno.

1.2 A exploração florestal durante o período colonial conduziu a uma redução inicial e significativa do alto valor das florestas, devido ao abate preferencial das árvores das espécies mais valiosas.

Durante as últimas duas décadas a exploração florestal intensificou-se de uma forma descontrolada. Não há nenhum controle efectivo. Os impactos negativos nas principais florestas que restam são certamente extremamente severos. A consulta de informação já disponível não é suficiente para dar uma base as análises quantitativas detalhadas.

Contudo, é possível distinguir duas dinâmicas principais:

Primeira, o derrube legal e ilegal está diminuindo extrema e rapidamente o potencial para uma futura prática da silvicultura em todas as florestas de Cabo Delgado.

A relevância desta degradação com respeito ao reflorestamento e serviços de ecossistemas ecológicos não podem ser avaliadas com base nos dados e observações disponíveis. Esta dinâmica negativa foi reduzindo ligeiramente com o estabelecimento e gestão do Parque Nacional das Quirimbas. E também, pouco a pouco, por uma melhoria na gestão das concessões florestais já estabelecidas.

Segunda, nas regiões circundantes aos mais importantes centros urbanos – nomeadamente Pemba e Montepuez – registam-se rápidas degradações de extensas áreas florestais ao longo das estradas. Podem-se observar manchas de floresta degradada que chegam a atingir os 100 km de extensão. Estes resultados são causados pela exploração exagerada das florestas para produção de carvão.

1.3 As escassas actividades de projectos de desenvolvimento rural que visam encorajar e aumentar os recursos florestais têm-se mostrado, até agora, muito limitadas e tem tido uma fraca relevância e impacto no estado dos ecossistemas. Foram feitas experiências importantes, contribuindo para o conhecimento hoje disponível no que diz respeito a gestão florestal. Porém, a ausência completa de monitoria sistemática e protecção de ensaios instaladas reduz dramaticamente as capacidades de ganhar experiência e conhecimento bem como a capacidade institucional.

A experiência específica feita pelo projecto FO-9 que teve inicio em 1982 para implementar actividades de reflorestamento, e plantações de agrosilvicultura com espécies exóticas como camadulensis de Eucalipto, E. *citriodora, arborea de Gemelina, Aziderachta indica, siamea de Cássia, leucacephola de Leucaena, e regia de Delonix poderiam fornecer uma base para avaliar o potencial destas espécies.* Porém, o valor destas experiências (e de outras por varias razões como a Mahate Florestal) está reduzido devido a destruição contínua dos espaços de plantação através do cultivo agrícola. Como não se verificou um acompanhamento efectivo em relação às plantações estabelecidas, estas foram considerados abandonados e convertidas em machambas sendo altamente apreciados pela boa qualidade da terra. Plantações pequenas com espécies nativas foram completamente destruídas.

Assim, as principais lições aprendidas são as seguintes: a) as medidas de reflorestamento apresentam um risco alto de fracasso e tem sido de pouco valor para responder as necessidades socio-econômicas e assim satisfazer finalidades ecológicas; b) a falta de capacidade institucional para tirar proveito das experiências de silvicultura e desenvolver conhecimento previne qualquer melhoria sistemática de gestão de floresta em Cabo Delgado.

1.4 O uso sustentável de recursos renováveis só pode ser alcançado com base num sistema onde os múltiplos usuários e actores estão atentos ao objectivo de sustentabilidade e decididos a regular e gerir as suas actividades extractivas adequadamente. O uso sustentável ou insustentável de recursos é moldado por uma combinação de factores biofísicos e socio-económicos, de uma forma multi-nível.

Uma componente fundamental de conhecimento em desenvolvimento e capacidade de gestão sustentável dos ecossistemas florestais e a identificação da dinâmica no uso social e económico dos recursos fundamentais. Uma pesquisa

preliminar sobre uso e exploração florestal em Cabo Delgado indica que uma investigação adicional deveria tratar dessas problemáticas:

(i) os serviços que o ecossistema fornece para apoiar a sustentabilidade das pessoas (trabalhos de ecossistema como os usados pelo Millennium Ecosystem Assessment); ii) os efeitos económicos e sociais na comunidade (emprego, saúde, educação) da exploração de recursos através de concessões para exploração a empresas ou indivíduos e na região (investimento, transferência tecnológica, acesso de mercado, investimento); iii) a cadeia de valor do produto florestal.

2. Objectivos da Pesquisa

Tendo em conta os desafios acima descritos, o objectivo geral do ESAPP Q804 é de orientar um processo de aprendizagem interdisciplinar para construir capacidade em gestão florestal e pesquisa.

O processo de aprendizagem incluirá duas linhas de pesquisa:

2.1 Biofísico: capacidade de Regeneração e seu melhoramento através de gestão e silvicultura.

Esta linha de pesquisa deveria contribuir para gerar dados melhorados sobre exploração, regeneração e reflorestamento de 4 espécies de árvores de madeira de 1ª classe (i) Chanfuta - quanzensis de Afzelia; (ii) Jambirre/Panga-panga - stuhlmannii de Millettia; (iii) Pau Ferro - madagascariensis de Swartzia e (iv) Umbila - angolensis de Pterocarpus (se disponível).

2.2 Socio-económico: Impactos de gestão florestal e corte de arvores nos meios de subsistência (serviços locais e renda, implementação de projectos de fauna bravia, e da Lei de Floresta e a distribuição dos 20 por centos a população) e ecossistemas.

3. Resultados esperados

Como resultado do processo de aprendizagem, será orientada uma capacitação nos seguintes níveis:

3.1 Aumento de conhecimento e consciência do uso sustentável de produtos florestais e serviços pelas comunidades e representantes das comunidades.

3.2 Desenvolvimento de capacidade para os profissionais Moçambicanos, académicos e estudantes sobre exploração florestal, pesquisa, experiências interculturais e geração de conhecimento.

3.3 Aumento de conhecimento e consciência dos efeitos das técnicas de gestão de um actor do sector privado (MITI) em reflorestamento no Norte de Moçambi-

que. Estes conhecimentos estão sendo implementados e partilhados com todos os interessados e com os Serviços Provinciais de Floresta, Fauna e silvicultura da província de Cabo Delgado. A ideia é apoiar a implementação de regulamentos existentes ou a melhorar e os planos de gestão.

3.4 Apoio ao Sector Privado e aos Serviços Florestais na gestão e conservação de recursos florestais na Província de Cabo Delgado, reconhecendo e respeitando as necessidades e direitos das comunidades.

4. Assuntos metodológicos

4.1 O processo de aprendizagem que acontecerá no mês de Novembro nos distritos seleccionados de Cabo Delgado terá como objecto de estudo a aprendizagem da Metodologia de Sustentabilidade desenvolvida pelo CDE da Universidade de Bern.

Este processo de aprendizagem será complementado pelo trabalho de estudantes da UEM que estejam a desenvolver trabalho para os seus graus de Mestrado com especial atenção aos aspectos biofísicos dos ecossistemas florestais seleccionados, como também intervenções e os impactos deles/delas e as condições socioeconómicas (sustentabilidade) e a importância presente e futura de serviços dos ecossistemas florestais para a população interessada.

4.2 Uma abordagem multi-dimensional e multi-nível é fundamental para compreender o uso sustentável em combinação com a Aprendizagem de Metodologia de Sustentabilidade (AMS) e outras abordagens metodológicas (a serem desenvolvidos pela UEM e o CDE).

4.3 O conceito de uso sustentável de recursos naturais é central às questões a serem pesquisadas e consequentemente será importante para desenvolver um entendimento comum de "uso sustentável de recursos naturais" entre os integrantes da equipe de pesquisa e outros actores fundamentais.

Esta compreensão comum deveria ser o resultado de um processo participativo que deverá acontecer antes, durante e depois do seminário de **Aprendizagem da Metodologia de Sustentabilidade** em Cabo Delgado.

Para satisfazer esta condição comum, deveriam ser partilhadas referências bibliográficas entre as equipas de pesquisa durante os meses de Outubro e Novembro. Uma referência fundamental para este propósito é o Millennium Ecosistem Asessment que concebe "uso sustentável" como "manter a taxa de regeneração (trabalhos/serviços de apoio) para manter os serviços dos usuários de forma sustentável."

5. Participantes

5.1 Equipa interdisciplinar de pesquisa (silvicultura, história, antropologia, desenvolvimento económico)

- UEM: Membros do corpo docente da UEM, especialmente das Faculdade de Agronomia e Florestas e Faculdade de Letras e Ciências Sociais e estudantes que estejam envolvidos em cursos de mestrado.
- CDE: Dois membros do corpo docente que realizam investigação sobre Moçambique.

5.2 Seminário de "Aprendizagem de Metodologia de Sustentabilidade" em Cabo Delgado

- No seminário a realizar em Novembro no distrito de Mocimboa da Praia deverão participar pessoas indicadas pelas seguintes instituições tomando em conta o seu perfil e responsabilidades em relação a intervenção na gestão florestal.

- Foram identificadas para enviar participantes as seguintes instituições: MITI Limitada, DPA Cabo Delgado, Universidade Católica de Moçambique Faculdade de Turismo de Cabo Delgado, Administração dos Distritos, ONG´s – AMA, Justiça Ambiental, IBIS, ORAM, AKDF, Direcção Provincial do Turismo de Cabo Delgado - Parque Nacional das Quirimbas, Direcção Provincial do Meio Ambiente. Direcção Provincial do Ministério de Planificação e Desenvolvimento Rural, Projecto de Ecoturismo de Mareja, Maluane eco-turismo.

- Esta lista foi constituída para ser o mais abrangente possível. O número de participantes efectivos dependera da disponibilidade dos quadros e do seu interesse pelo seminário**.**

6. Plano de Trabalho para o Seminario

Data	**Local**	**Participantes**
10º -12º de Novembro	Pemba	Preparação dos trabalhos por Andreas Klaey e Yussuf Adam
20º de Novembro (noite)	Mocimboa da Praia	Encontro com a equipa principal de pesquisa
21	Partida para aldeia em Cabo Delgado	Equipa principal de pesquisa
21-24 de Novembro	Aldeia em concessão (s)	Equipa Principal de pesquisa Comunidades MITI
25-28º de Novembro	Mocimboa da Praia	
29º de Novembro		Fim do trabalho da equipe principal, início das actividades de pesquisa específicas,